VERSION SHOWING CHANGES MADE

49. (Amended) A method of determining the presence of a target analyte in a sample comprising:

a) acquiring a first data image of a random array composition comprising:

i) a substrate with a surface comprising discrete sites;

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein at least one of said subpopulations does not contain an optical signature; and

iii) a fiducial,

wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres;

b) using said fiducial to register said first data image to create a registered first data image;

c) contacting said random array composition with said sample;

d) acquiring a second data image from said array with said sample;

e) registering said fiducial to register said second data image to create a registered second data image; and

f) comparing said first and said second registered data images to determine the presence or absence of said target analyte.

61. (Amended) A method of determining the presence of a target analyte in a sample comprising:

a) providing a registered first data image of a random array composition comprising:

i) a substrate with a surface comprising discrete sites;

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein at least one of said supopulations does not contain an optical signature; and

iii) a fiducial,

wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres;

b) contacting said random array composition with said sample;

c) acquiring a second data image from said array with said sample;

d) using said fiducial to register said second data image to create a registered second data image; and

e) comparing said first and said second registered data images to determine the presence or absence of said target analyte.

PENDING CLAIMS

49. A method of determining the presence of a target analyte in a sample comprising:

a) acquiring a first data image of a random array composition comprising:

i) a substrate with a surface comprising discrete sites;

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein at least one of said subpopulations does not contain an optical signature; and

iii) a fiducial,

wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres;

b) using said fiducial to register said first data image to create a registered first data image;

c) contacting said random array composition with said sample;

d) acquiring a second data image from said array with said sample;

e) registering said fiducial to register said second data image to create a registered second data image; and

f) comparing said first and said second registered data images to determine the presence or absence of said target analyte.

50. The method according to claim 49 wherein said random array comprises a fiber optic bundle and the registration of said first data image utilizes a fiducial fiber.

51.The method according to claim 49 wherein said random array comprises microspheres and the registration of said first data image utilizes a fiducial microsphere.

52. The method according to claim 49 wherein the registration of said first data image utilizes a fiducial template.

53. The method according to claim 49 wherein said bioactive agents are proteins.

54. The method according to claim 49 wherein said bioactive agents are nucleic acids.

61. A method of determining the presence of a target analyte in a sample comprising:

a) providing a registered first data image of a random array composition comprising:

i) a substrate with a surface comprising discrete sites;

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein at least one of said supopulations does not contain an optical signature; and

iii) a fiducial,

wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres;

b) contacting said random array composition with said sample;

c) acquiring a second data image from said array with said sample;

d) using said fiducial to register said second data image to create a registered second data image; and

e) comparing said first and said second registered data images to determine the presence or absence of said target analyte.

62. The method according to claim 49, wherein said substrate is selected from the group consisting of glass and plastic.

63. The method according to claim 49 or 62, wherein said registration of said first data images utilizes a fiducial edge.

64. The method according to claim 49 or 62, wherein at least a first edge of said array is a fiducial edge.

65. The method according to claim 51, 52, 53 or 54, wherein said substrate is selected from the group consisting of glass and plastic.

66. The method according to claim 49 or 62, wherein each subpopulation comprises a unique optical signature.

67. The method according to claim 66, wherein said unique optical signature is a bleed-through signature.

68. (Amended) The method according to claim 49 or 62, wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand whereby the identification of the bioactive agent is elucidated.

69. The method according to claim 50, wherein said array comprises at least three fiducials, and each of said fiducials is a fiducial fiber.

70. The method according to claim 69, wherein at least one of said fiducial fibers has a different shape from the others.

71. The method according to claim 69, wherein at least one of said fiducial fibers has a different color from the others.

72. The method according to claim 51, wherein said registration utilizes at least three fiducials and each of said fiducials is a fiducial microsphere.

73. The method according to claim 72, wherein at least one of said fiducial microspheres has a different size from the others.

74. The method according to claim 72, wherein at least one of said fiducial microspheres has a different color from the others.

75. The method according to claim 72, wherein at least one of said fiducial microspheres does not comprise a label.